A REVISION OF THE SYNONYMY OF THREE SPECIES OF LEIOLOPISMID SKINKS FROM NEW ZEALAND

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SYNOPSIS

The synonymies of three species of New Zealand skinks are reviewed and clarified. Their valid names are *Leiolopisma ornatum* (Gray), *L. zelandicum* (Gray) and *L. moco* (Duméril & Bibron).

INTRODUCTION

FOR MANY years there has been considerable confusion over the identity of some species of New Zealand skinks ; and it has been evident that some basic errors must have occurred in their complex synonymies.

Historically, it is easy to see how this could have happened. The initial collection of biological specimens in New Zealand was done by scientists from the northern hemisphere, some of whom accompanied various expeditions (U.S. Exploring Expedition, 1838–1842 ; *Erebus & Terror*, 1839–1843 ; *Novara*, 1857–1859 ; *Challenger*, 1873–1876 ; and a few (such as Dr Dieffenbach, naturalist to the New Zealand Company) who travelled independently. In all cases, the material collected was sent back to various European and American museums, and thus many reptilian (and other) type specimens came to be lodged in London, Paris, Hamburg and certain American cities. Furthermore, as several expeditions were operating in the Pacific during the period 1835–1870, a few species were described almost simultaneously in different reports, resulting in a taxon being given different specific, or even different generic names. Another source of error was the fact that recorded details of the localities from which specimens were taken were often meagre in the extreme. Thus not only are many specimens merely labelled 'New Zealand', but in some cases there is doubt about whether they were in fact taken in New Zealand, Tasmania or Australia.

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For some years after the settlement of New Zealand much material was still despatched to the British Museum for identification and lodgement. Gradually, as museums became established in New Zealand, more and more material was deposited locally. Thus, by the time McCann (1955) made his notable revision of the New Zealand lizards, he was faced with the situation where many type-specimens, being deposited in European or American institutions, were unavailable to him and he had to rely on the frequently meagre descriptions already published and any further information that could be supplied by the Curators of the day from the by then often badly faded type-material. It is not surprising that in some cases McCann made mistakes in relating unseen type-specimens to particular series held in New Zealand museums.

The present revision has been made in the British Museum (Natural History) (BM(NH)), using material held there, and comparing it directly with recently collected series brought from New Zealand, and with other material kindly lent by the Paris Museum of Natural History (MNHP), and the Leiden Museum of Natural History.

DESCRIPTION OF SPECIES

Leiolopisma ornatum (Gray)

Tiliqua ornata Gray, 1843 : 202.
Hinulia ornata (part) Gray, 1845a : 77.
Hinulia ornata (part) Gray, 1845b : 7.
Cyclodina aenea Girard, 1857 : 196.
Euprepes ornatus Steindachner, 1867 : 49.
Lygosoma aeneum Boulenger, 1887 : 275.
Lygosoma ornatum Boulenger, 1887 : 317, Pl. 26, Figs 1, 1a.
Liolepisma aeneum Lucas & Frost, 1897 : 278.
Homolepida ornatum Lucas & Frost, 1897 : 279.
Leiolopisma aeneum McCann, 1955 : 102.
Sphenomorphus pseudornatus McCann, 1955 : 125.

Description. Habit lacertiform ; body rather stout ; limbs well developed, pentadactyl ; snout short, obtuse ; lower eyelid with a divided or undivided transparent disc ; nostril pierced in the nasal ; no supranasal ; frontonasal broader than long, forming a suture with the rostral and the frontal ; prefrontals small, clearly separated ; frontal equal to or a little longer than the frontoparietals, and shorter than the frontoparietals and interparietal together, in contact with the first and second supraoculars ; 4 supraoculars, the second the largest, the third almost equal to it ; 7 or 8 supraciliaries ; parietals bordered by a pair of nuchals and a pair of temporals ; one pair of nuchals, sometimes followed by several pairs of enlarged dorsal scales ; 6–8 supralabials ; 5 or 6 infralabials ; anterior and posterior loreals contact up to $\frac{2}{3}$ (occasionally all) of the upper border of the second supralabial ; subocular scales row complete, excluding any supralabials from the orbit ; earhole circular, smooth or with a few anterior lobules ; 26–30 mid-body scale-rows, scales more or less striated, laterals smallest, dorsals and ventrals almost equal in size ; preanal scales somewhat enlarged ; limbs short, and when adpressed

just meet or are distant ; digits subcylindrical, 15–21 smooth lamellae below the fourth toe, and 43–60 in total below toes two to five inclusive (in general the higher numbers occur in specimens from the northern part of the species' range) ; tail slightly longer than snout–vent length, and tapering finely.

Measurements (of larger specimen in type bottle BM 1946.8.19.38). End of snout – forelimb 20 mm ; axilla – groin 30 mm ; snout – vent 56·5 mm ; tail 61 mm ; nostril – anterior of eye 2·25 mm ; nostril – anterior of ear 9 mm ; posterior of ear – axilla 10·5 mm.

Colour. Mottled coppery brown dorsally ; somewhat paler laterally with dark brown markings ; and creamy-white ventrally, often with scattered dark spots, and chin and throat often heavily speckled with black. An irregular pale line bordered below by dark brown or black extends from above the eye to the root of the tail ; and below the eye there is a pale spot edged with dark brown – this gives a 'tear-drop' effect.

Distribution. New Zealand, endemic. Common in many parts of the North Island and on off-shore islands.

Type locality. Cook's Straits, New Zealand. Types in BM(NH).

Synonymy. This species has the most confused synonymy of any of the three under consideration. The original description of *Tiliqua ornata* given by Gray (1843), specifically mentioned that he had only a single specimen. Two years later in his *Catalogue of Lizards*, Gray (1845a) transferred the species to *Hinulia*, and listed a second specimen (presumably in a separate bottle), of which he gave a somewhat different description. The second is probably BM XV.11.b, which has in the past been listed as a syntype of *H. ornata*, but is in fact a specimen of *Leiolopisma moco*. Specimen (a) of Gray's (1845a) *Catalogue of Lizards* must be the type of *T. ornata*. The accession number on the bottle is 42.8.19.2, and the corresponding entry in the accession book reads '*Tiliqua ornata* Gray. N.Z. Presented by R. Owen, Esq. from specimens sent by Dr. Dieffenbach to the College of Surgeons'. Boulenger (1887 : 317) evidently found two specimens in bottle no. 42.8.19.2, as he listed an adult and a half grown animal as types. These two specimens are still extant, and still in one bottle ; they are listed by their post-war numbers, 1946.8.19.38 and 1946.8.19.39. There is no way of telling which is the original specimen, or when or from whence the second specimen came to the Museum. However, as both belong to the same species there is no question of confusion of specific identity.

The diagram of *H. ornata* referred to by Gray (1845b : pl. 11, fig. 1) clearly was not drawn from either of these specimens, and is probably of BM XV.ii.b (*Leiolopisma moco*). Although Gray (1845b) referred to this figure on p. 7 where he listed it as pl. 11, fig. 2, it was not published until 1867, and was later included by Günther (1875).

One of the best diagnostic characters of *L. ornatum*, taken in conjunction with size and colour, is the complete subocular scale row, which excludes any of the upper labials from the orbit. This feature is clearly seen on the two specimens now known as types, but was not mentioned by Gray in either of his descriptions.

In 1857 Girard published a description of *Cyclodina aenea* from New Zealand and from the details he gave, including reference to the complete subocular row, it is clear he was dealing with the species named *H. ornata* by Gray. Boulenger (1887) recognized that Gray had included specimens of two species in his description of *H. ornata*, and referred part of Gray's *H. ornata* to *Lygosoma ornatum*, and part to *L. moco*. Boulenger gave a much more detailed description of *L. ornatum* than had Gray, and referred specifically to the scaly lower eyelid (mentioned by Gray in his diagnosis of the genus *Hinulia*), and the yellow, dark-edged spot below the eye. He did not mention the complete subocular scale row, though this feature is very clearly shown in his illustrations of the species (Boulenger, 1887, pl. xxvi, figs 1, 1a).

Lucas & Frost (1897) transferred the species to the genus *Homolepida* Gray, and did not attempt a redescription, but quoted verbatim from Boulenger. They added this comment: 'In habit and coloration this lizard has a strong resemblance to *Leiolopisma aeneum*' and gave the distribution of *H. ornatum* as 'The neighbourhood of Auckland'. (Steindachner, 1867, referred to 'numerous examples from Auckland'.)

McCann (1955) also recognized that Gray had included members of two species in his description of *H. ornata*, but erred in stating that Gray regarded his *Tiliqua ornata* and *Hinulia ornata* as conspecific. In fact the name *H. ornata* was a subsequent usage of *T. ornata* and so the same type specimen relates to both names. McCann also believed Gray's type(s) to be lost.

On the correct premise that Gray had included two species under one description, and the erroneous premise that he regarded *T. ornata* and *H. ornata* as conspecific, and must therefore have had two type specimens, McCann tried to deduce which were the two species concerned. He pointed out that while Gray (1845a) had mentioned the scaly lower eyelid in defining the genus *Hinulia*, he had made no mention of it in describing *T. ornata* (1843). McCann therefore assumed that Gray had confused two species, which could in fact be separated on the basis of presence or absence of a scaly lower eyelid, and that as this was 'an error of determination' the name *H. ornata* was invalid (Rules of Nomenclature: Art. 49).* McCann accordingly retained the specific name '*ornata*' for the species he assumed to have been Gray's *Tiliqua ornata*, and renamed Gray's *Hinulia ornata* as *Sphenomorphus pseudornatus*. To complicate the issue further, McCann did not recognize *L. aeneum* as conspecific, nor that the scaly character of the lower eyelid is extremely variable, and not a good character for this species. From examination of many specimens it is clear that while many individuals do show this feature, many more may lack it, or even possess a scaly eyelid on one side, and an undivided transparent disc on the other.

Leiolopisma zelandicum (Gray)

Tiliqua zelandica Gray, 1843 : 202.
Mocoa zelandica (part) Gray, 1845a : 82.
Lygosoma moco (part) Boulenger, 1887 : 272.
Leiolopisma moco (part) Lucas & Frost, 1897 : 276.
Leiolopisma ornata McCann, 1955 : 109.

* Quoted as Art. 31 by McCann.

DESCRIPTION. Habit lacertiform; body moderately elongate; limbs well developed, pentadactyl; snout short, subacute; lower eyelid with an undivided transparent or opaque disc; nostril pierced towards the centre of the nasal; no supranasal; rostral almost twice as wide as deep; frontonasal domed posteriorly, forming a suture with the rostral and the frontal, prefrontals widely separated; frontal longer than the frontoparietals, but shorter than the frontoparietals and interparietal together, in contact with the first and second supraoculars; 4 supraoculars, the second the largest, and the first the smallest; 7 or 8 (occasionally 9) supraciliaries; parietals bordered by a pair of nuchals and a pair of temporals; 1–3 pairs of nuchals, sometimes followed by up to 3 pairs of enlarged dorsal scales; 7 supralabials; 6 or 7 infralabials; anterior and posterior loreals contact the entire upper border of the second supralabial, the posterior loreal sometimes extending slightly above the third supralabial; subocular scale row interrupted by the fifth supralabial; earhole oval or circular, with few or many projecting lobules; 32–34 mid-body scale rows, the dorsal scales largest and faintly striate; preanal scales not or slightly enlarged; adpressed limbs just meet or fail to meet; digits moderately long, subcylindrical, 16–21 smooth lamellae below the fourth toe, and 50–62 in total below toes two to five inclusive; tail stout, tapering, somewhat longer than snout–vent length.

MEASUREMENTS OF TYPE (BM 1946.8.16.19). End of snout – forelimb 16·00 mm; axilla – groin 27·00 mm, snout – vent 48·00 mm, tail 67·00 mm, nostril – anterior of eye 2·5 mm, nostril – anterior of ear 8·00 mm, posterior of ear – axilla 9·00 mm. (The type specimen is not a fully mature animal.)

COLOUR. Dorsal surface olive brown with a variable pattern of dark flecks or blotches; the head may be unmarked, or heavily marked with dark areas. A large dark spot is normally discernible on the outer edge of each parietal, though this feature is not unique to this species. A pale dorso-lateral line extends posteriorly from behind the eye, breaks up into disjointed specks behind the insertion of the forelimb and continues so on to the tail. This line is bordered below by black. A lateral line extends from the ear to the top of the forelimb and becomes broken up into an irregular pattern of markings along the flanks. These two pale lines are separated by a variable wide brown band. There is a pale line on the dorsal surface of the forelimb and a similar, but more broken line on the dorsal surface of the hindlimb. Ventral surface pale creamy-white; the chin and throat or the entire undersurface may be speckled with black or dark brown.

DISTRIBUTION. New Zealand, endemic. Mainly found in the Wellington district and on the islands in Cook's Strait.

TYPE LOCALITY. Cook's Straits. Type in BM(NH), BM 1946.8.16.19.

SYNONYMY. In 1843 Gray described a new species of skink from New Zealand as *Tiliqua zelandica*, based on only one specimen. In 1845a, b, he transferred *T. zelandica* to *Mocoa zelandica* and Boulenger (1887) included both names in the synonymy of *Lygosoma moco* (Duméril & Bibron) while Lucas & Frost (1897) followed Boulenger's lead. McCann (1955) concluded, correctly, that there was no

evidence to suggest that Duméril & Bibron's (1839) *Lygosoma moco* and Gray's (1843) *T. zelandica* were conspecific, and that *Lygosoma moco* as defined by Boulenger (1887) consisted of two species, *L. moco* and *L. zelandica*. Unfortunately, McCann was not able to examine the type specimen of *L. zelandica*, and on the information available to him, related it to a different species, and not to the correct one, which he regarded as *L. ornata*.

Leiolopisma moco (Duméril & Bibron)

Lygosoma moco Duméril & Bibron, 1839 : 718.
Hinulia ornata (part) Gray, 1845a : 77.
Mocoa zelandica (part) Gray, 1845a : 82.
Mocoa owenii (part) Gray, 1845a : 272.
Mocoa zelandica (part) Gray, 1845b : 8.
Euprepes moco (part) Steindachner, 1867 : 47.
Mocoa zealandica (part) Günther, 1875 : 13, Pl. 7, Fig 4.
Lygosoma moco (part) Boulenger, 1887 : 272.
Leiolopisma moco (part) Lucas & Frost, 1897 : 276.
Leiolopisma moco McCann, 1955 : 104.
Leiolopisma zelandica (part) McCann, 1955 : 106.

Description. Habit lacertiform ; body moderately elongate ; limbs well developed, pentadactyl ; snout short, obtuse ; lower eyelid with an undivided transparent disc ; nostril pierced more or less in the centre of the nasal ; no supranasal ; rostral less than twice as wide as deep ; frontonasal broader than long, often pointed posteriorly, forming a suture with the rostral and the frontal ; prefrontals distant or nearly meeting ; frontal shorter than the frontoparietals and interparietal together, in contact with the first and second supraoculars ; 4 supraoculars, the second largest and the first smallest ; 6–8 supraciliaries ; parietals bordered by a pair of nuchals and a pair of temporals ; 2–5 pairs of nuchals, sometimes followed by enlarged dorsals ; 7 or 8 supralabials ; 6 or 7 infralabials ; anterior and posterior loreals contact upper border of second supralabial and up to ½ of third supralabial ; subocular row interrupted by the fifth (rarely sixth) supralabial ; earhole circular, with few to many anterior lobules ; 28–34 mid-body scale rows, the dorsal scales largest, smooth or faintly striate ; preanal scales enlarged or not enlarged ; adpressed limbs meet or fail to meet ; digits moderately long, subcylindrical, 18–27 smooth lamellae below the fourth toe, and 60–69 (rarely 53–73) in total below toes two to five inclusive ; tail relatively long and tapering, at least 1⅓ times the snout–vent length.

Measurements of type (MHNP 3019). End of snout – forelimb 23 mm ; axilla – groin 33 mm ; snout – vent 66 mm ; tail (broken) ; nostril – anterior of eye 3 mm ; nostril – anterior of ear 10 mm ; posterior of ear – axilla 11 mm.

Colour. In this species colour and pattern are very variable. Generally coppery or olive brown, usually with a (sometimes double), mid-dorsal dark line ; a narrow pale dorso-lateral stripe extending from the snout to the base of the tail, and a similar lateral stripe from behind the ear to the groin, both these pale stripes are edged above and below by a narrow dark line. Between the two is a wider

mid-brown stripe, approximately two scales wide, and may be plain or speckled or broken up into dark blotches. The linear markings may be straight-edged or irregular. The ventral surface is very pale grey or cream-coloured, sometimes with dark specks in longitudinal rows. In some specimens there is an X-shaped mark on the dorsal surface of the head, between the two series of supraoculars ; and there may be a dark spot on each labial scale.

DISTRIBUTION. New Zealand, endemic.

TYPE LOCALITY. 'New Zealand'. Type in the National Museum of Natural History, Paris.

SYNONYMY. The synonymy of this species is interwoven with that of *L. zelandicum*, and to a much lesser extent, with that of *L. ornatum*. Duméril & Bibron (1839) based their description of the species partly on the type in the National Museum of Natural History in Paris, and partly on specimens held in London. They comment '. . . we have seen several specimens in the collection of the Zoological Society of London, labelled *Tiliqua moco* by Mr. Gray'.* These latter specimens cannot now be traced. However, the name *Tiliqua moco* Gray, quoted by Duméril & Bibron (1839) was never published, and Gray himself lists the name in the synonymy of *Mocoa zelandica* as '*Tiliqua moco* Gray M SS.' (1845a, b). Thus the first published name of the species was *Lygosoma moco* Dum. & Bibr., 1839.

In 1843 Gray described *Tiliqua zelandica*, and in 1845 he described *Mocoa zelandica* and referred *T. zelandica* to the synonymy of the species, as well as giving Duméril & Bibron's (1839) reference. This mistaken assumption that *T. zelandica* and *L. moco* were conspecific was perpetuated by Steindachner (1867), Günther (1875) and Boulenger (1887), although the latter was responsible for recognizing that Gray (1845a, b) had confused a specimen of *L. moco* with *Hinulia ornata*. Lucas & Frost (1897) followed Boulenger's synonymy for *L. moco*. As has already been stated McCann (1955) recognized that *L. moco* and *T. zelandica* were not conspecific, but unfortunately associated the latter name with the wrong species.

In passing, it is appropriate to note that McCann was probably wrong in including *Hinulia variegata* Buller (1870) and *Mocoa striata* Buller (1870) in the synonymy of *L. zelandica* ; they are more likely to be conspecific with *L. moco*. However, as the specimens are no longer available, and the descriptions given are meagre, it is not possible to be sure of their identity.

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* Author's translation.

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